Volunteer Lake Assessment Program Individual Lake Reports

ONWAY LAKE, RAYMOND, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	5,867	**Max. Depth (m):**	8.9	**Flushing Rate (yr^{-1}):**	5.3
Surface Area (Ac.):	192	**Mean Depth (m):**	3	**P Retention Coef:**	0.5
Shore Length (m):	3,900	**Volume (m^3):**	2,160,000	**Elevation (ft):**	265

TROPHIC CLASSIFICATION

Year	Trophic class
1989	MESOTROPHIC
2004	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

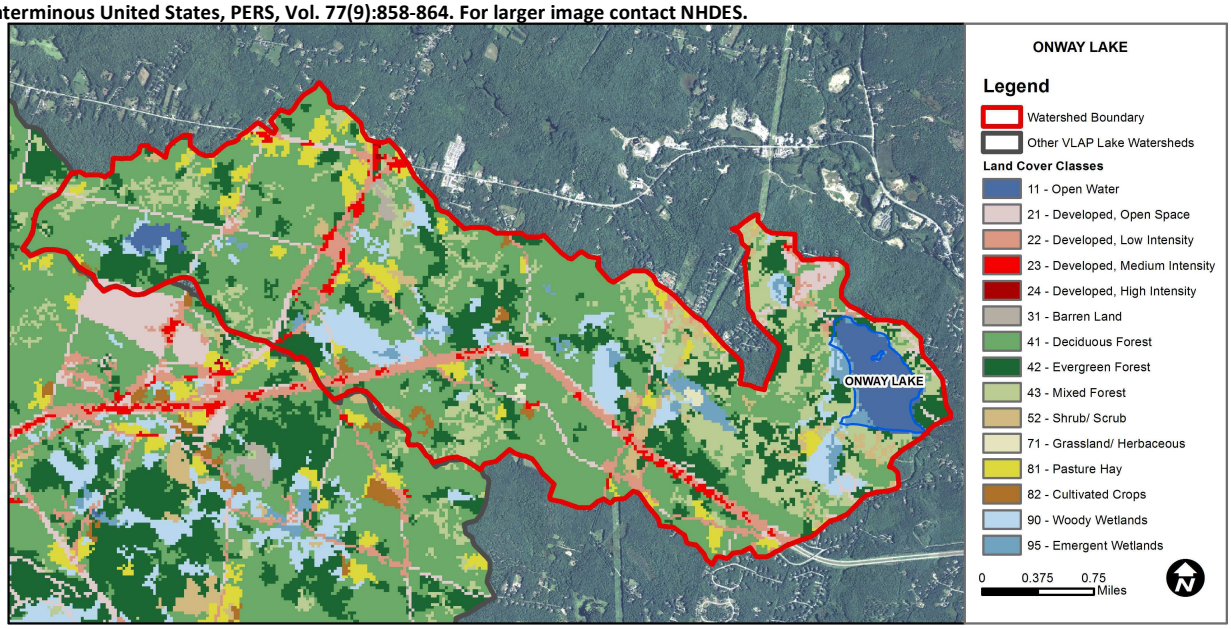
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

ONWAY LAKE - CAMP ONWAY BEACH	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
ONWAY LAKE - RAYMOND TOWN BEACH	Escherichia coli	No Data	No data for this parameter.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	3.54	Barren Land	0.27	Grassland/Herbaceous	0.2
Developed-Open Space	3.57	Deciduous Forest	42.19	Pasture Hay	4.05
Developed-Low Intensity	5.09	Evergreen Forest	14.73	Cultivated Crops	0.45
Developed-Medium Intensity	1.41	Mixed Forest	13.37	Woody Wetlands	6.26
Developed-High Intensity	0.04	Shrub-Scrub	2.51	Emergent Wetlands	2.28

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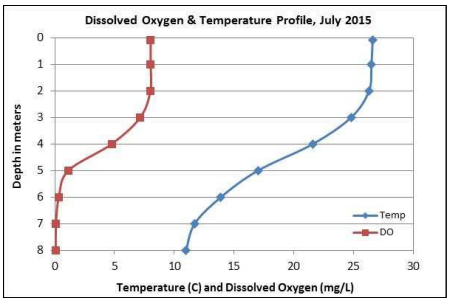
Onway Lake, Raymond

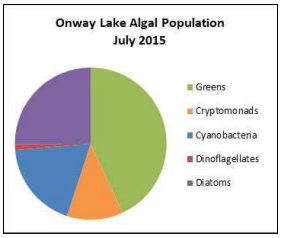
2015 Data Summary

Recommended Actions: Conductivity levels remain elevated likely due to winter road salt application. Educate and encourage local road agents, winter maintenance companies and residents on best practices for salt application on roads, parking lots, driveways, and walkways. Encourage agents to obtain a NH Voluntary Salt Applicator License through UNH Technology Transfer Center's Green SnowPro Certification program. The dry weather conditions led to low phosphorus and chlorophyll levels in the pond. This highlights the importance of managing stormwater runoff in the watershed. Educate watershed residents on ways to reduce stormwater runoff from their properties by utilizing DES' "N.H. Homeowner's Guide to Stormwater Management".

Observations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were low in July, decreased from 2014 and were less than the state median. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **Conductivity/Chloride:** Deep spot, nearshore and tributary station conductivity and chloride levels were elevated and much greater than the state medians. Historical trend analysis indicates highly variable epilimnetic (upper water layer) conductivity since monitoring began.
- **E. coli:** E. coli levels were low at all stations and much less than the state standard of 406 cts/100 mL for surface waters.
- **Total Phosphorus:** Epilimnetic phosphorus levels were low, stable with 2014 and less than the state median. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Metalimnetic (middle water layer) phosphorus was within a moderate range and hypolimnetic (lower water layer) phosphorus levels were slightly elevated likely due to the release of phosphorus from bottom sediments when dissolved oxygen levels decrease below 1.0 mg/L, a process called internal loading. Tributary and nearshore station phosphorus levels were within low to average ranges.
- **Transparency:** Transparency (NVS) was within an average range for the pond in July, was stable with 2014, and was slightly less than (worse than) the state median. Historical trend analysis indicates highly variable transparency since monitoring began. Transparency measured with the viewscope (VS) was much better than that measured without (NVS) and likely a better representation of conditions.
- **Turbidity:** Epilimnetic and metalimnetic turbidities were within average ranges. Hypolimnetic turbidity was elevated and likely due to the formation and accumulation of organic compounds under anoxic conditions. Tributary and nearshore station turbidity levels were low.
- **pH:** Deep spot pH levels were lower than average and less than the desirable range 6.5-8.0 units. Tributary and nearshore station pH levels were within the desirable range. Historical trend analysis indicates highly variable epilimnetic pH since monitoring began.





Station Name	Table 1. 2015 Average Water Quality Data for ONWAY LAKE									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	8.0	2.89	43	208.0		8	2.87	3.85	1.16	6.15
Metalimnion				207.0		12			2.15	5.98
Hypolimnion				206.5		28			9.37	6.22
Dam Outlet				207.5	10	8			1.01	6.73
Island Road				207.0	10	8			1.00	6.82
No Name Inlet			76	369.0	50	14			0.65	6.79
Sandy Cove				208.0	10	7			0.99	6.81
Seannikki				208.0	10	7			1.09	6.80

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Stable	Trend not significant; data highly variable.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.